

SECTION 505 — HOT MIX ASPHALT PATCHES

505.01 DESCRIPTION. This work shall consist of repairing rigid, flexible, or composite pavements by removing part or all of the section of the existing pavement and replacing the removed materials using hot mix asphalt (HMA) paving material. The locations of the repairs will be as specified in the Contract Documents or as directed by the Engineer.

Partial Depth Patching (PDP). PDP shall consist of the removal of areas of unsound pavement material, up to a 50 percent maximum of the pavement thickness in depth, and replace with HMA as specified in the Contract Documents or as directed by the Engineer. The pavement thickness is defined as the thickness of all bound materials in the pavement structure including HMA, portland cement concrete (PCC), and any other asphalt or cement modified materials.

Full Depth Patching (FDP). FDP shall consist of the removal of specified areas of the full thickness of the pavement sections to the top of the aggregate base material and replace with HMA as specified in the Contract Documents or as directed by the Engineer. FDP shall be used whenever the 50 percent maximum pavement thickness for PDP has to be exceeded.

505.02 MATERIALS.

Graded Aggregate Base	901.01
Aggregates for HMA	901.01
Aggregates for Superpave Mixes	901.01 and MP2
Performance Graded Asphalt Binders and Hot Mix Asphalt	904
Crack Filler	911.01
Production Plant	915

505.03 CONSTRUCTION. The existing pavement shall be removed with a minimum disturbance to the base material and the faces of the remaining pavement shall be plane without ragged edges. The use of equipment that could damage the existing pavement is prohibited.

505.03.01 Weather Restrictions. Refer to Section 504.

505.03.02 Existing Pavement. Each day the Contractor shall complete all repairs for which excavation has been completed. Open excavated areas at the end of the work day are prohibited.

Removal of Pavement for PDP. For PDP the existing pavement shall be removed by milling, grinding, or saw cutting and removal to the specified

depth for the full perimeter of the designated area. Where concrete is encountered prior to reaching the specified depth, the depth of the patch shall then be limited to the top elevation of the PCC. Prior to application of the patch, the bottom of the excavation of all PDP shall be inspected and cleaned of all loose and foreign materials. For PDP of composite pavements, the PCC shall not be damaged during removal of the existing HMA and all spalled cracks and joints shall be tack coated, filled, and tamped with HMA before the patch is to be placed. When the material at the bottom of the PDP is determined to be unsuitable and not structurally adequate, additional material shall be removed until sound material is encountered. When PCC is encountered in a composite pavement and determined to be unsuitable, the removal and replacement of the patch shall follow the description and specification of a FDP.

Removal of Pavement for FDP. For FDP the existing pavement shall be removed by making a perpendicular saw cut full depth for the full perimeter of the designated area. The repair shall be excavated to the top of the aggregate base material. Refer to the applicable portions of 522.03.03 for the concrete portion of a composite pavement. The boundaries of the patch shall have square vertical faces after saw cutting.

505.03.03 Base and Subgrade Preparation. The Engineer will evaluate the aggregate base of the FDP area to determine if it is suitable as a foundation for the repair. When the Engineer determines that the aggregate base material is not stable, it shall be compacted as specified in 501.03.10 to the satisfaction of the Engineer. When no aggregate base is present under the pavement, the subgrade foundation shall be constructed as specified in Section 208, and as directed by the Engineer. When the Engineer determines that the aggregate base or subgrade material is unsuitable, the material shall be replaced with graded aggregate base conforming to Section 501. This operation is defined as removal and replacement of unsuitable material. The replacement aggregate material shall be compacted in layers of 4 in. maximum depth. The existing pavement materials that are removed shall be disposed of site immediately by the Contractor.

The Contractor shall protect the aggregate base or subgrade after preparation. No payment will be made for removal and replacement of subgrade that was not protected.

505.03.04 Subgrade Drains. The Engineer may direct that subgrade drains be constructed in areas of wet underlying subgrade or areas where there may be a future drainage problem as determined by the Engineer.

505.03.05 Emergency Filler. The Contractor shall have readily available sufficient cold patch material to completely fill the void of the repair area. This material shall be subject to the approval of the Engineer

and shall be placed and compacted in the void when directed by the Engineer. At the beginning of the next day's work, this material shall be completely removed as directed by the Engineer.

505.03.06 Steel Plates. The Contractor shall have an ample supply of 12 x 14 ft by 1 in. thick steel plates available on the project to cover the emergency filler.

505.03.07 Patch Construction. Patch construction shall conform to the applicable portions of Section 504. Manual operation will be permitted for placement of the HMA. Cores, control strip, and pavement profile measurements are waived. Equipment, placement, compaction, and quality control procedures shall be as approved by the Engineer.

505.03.08 Patch Placement. Prior to placing the HMA, the exposed vertical surface of all adjacent pavement shall be thoroughly cleaned and all vertical surfaces shall be tack coated in conformance with 504.03.04. The HMA mixture may be spread by shovel, rake or other method approved by the Engineer. Placing HMA on a frozen base is prohibited.

Minimum and maximum lift thickness for HMA Superpave mixes shall be maintained during patching in conformance with the following:

HMA SUPERPAVE LIFT THICKNESS		
MIX DESIGNATION (mm)	MINIMUM (in.)	MAXIMUM (in.)
9.5	1.0	2.0
12.5	1.5	2.5
19.0	2.0	3.0
25.0	3.0	4.0
37.5	4.0	5.0

505.03.09 Testing and Acceptance. Acceptance shall be determined by nuclear in place density test data and witnessed by the Engineer. The nuclear gauge shall be calibrated in conformance with MSMT 417 except that only five randomly selected locations shall be chosen in the first patch. The Contractor shall take one, one minute special calibration nuclear test from each lift of each patch. Test locations shall be randomly selected from within the patch. A special calibration nuclear test is defined as an average of two (minimum) special calibration readings taken at the same location after rotating the nuclear gauge 180 degrees.

Nuclear in place density test data shall be expressed as a percentage of the maximum specific gravity determined for each day's production. The in place density of each patch shall be 92.0 to 97.0 percent.

The results of all nuclear density tests from each patch shall be averaged and compliance will be determined on the basis of each patch tested.

505.04 MEASUREMENT AND PAYMENT. The payment will be full compensation for saw cutting, milling, grinding, removal, disposal, trimming of the existing pavement, subgrade preparation, placing all materials including tack coat, steel plates, emergency filler, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

All steel plates and emergency filler after removal shall remain the property of the Contractor.

505.04.01 Partial Depth Patching and Full Depth Patching will be measured and paid for at the Contract unit price per square yard or per ton as specified in the Contract Documents. The payment will be full compensation for furnishing, hauling, placing all material, additional removal of pavement above the aggregate base, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

505.04.02 Removal of Unsuitable Material and Refill will be measured and paid for at the Contract unit price per cubic yard. The payment will also include excavation and disposal of unsuitable material, backfilling with aggregate, and compaction.

SECTION 506 — GAP-GRADED HOT MIX ASPHALT

506.01 DESCRIPTION. This work shall consist of the placement of a gap-graded hot mix asphalt surface (GGHMA) as specified in the Contract Documents. GGHMA shall conform to Section 504, except as specified herein.

506.02 MATERIALS.

Gap-Graded Hot Mix Asphalt	904.05
Production Plant	915